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ERIOPHYID STUDIES XVIII

H. H. KEIFER
California Department of Agriculture

The present article continues the survey of Eriophyid mites native to California. The last installment of this series, XVII, appeared in this Bulletin, Vol. 40, No. 3, p. 93, Sept. 26, 1951. This installment adds ten more new species and four new genera to our list. Three of the new species are representatives of the mite complex found in the attractive magenta-colored erineum on Sierra maple leaves. One new species is from Mountain mahogany, *Cercocarpus*. One mite is from white fir, another from madrone, and one from California juniper.

PHYTOPTINAE

Anchiphytoptus Keifer, new genus

Body wormlike. Rostrum of moderate size, downcurved. Shield subtriangular, not projecting over rostrum base; dorsal tubercles ahead of rear shield margin, directing the dorsal setae forward; a frontolateral seta on the margin of the shield above each forecoxa. Anterior coxae connate, coxal setae as usual. Forelegs with frontodorsal tibial seta and lateral terminal tibial spur; hindlegs with patellar seta lateral. Abdomen with a subdorsal seta on each side a short distance caudad of the shield; abdominal rings microtuberculate, these microtubercles forming a pattern of longitudinal lines on the dorsal half. Female genital coverflap smooth except for a basal design of curved lines.

Genotype; *Anchiphytoptus lineatus,* new species.

Anchiphytoptus lineatus Keifer, new species

Plate 210

Female 210 μ long, 45 μ thick, wormlike. Rostrum 30 μ long, downcurved. Shield 28 μ long, 35 μ wide, subtriangular; median line present on rear ⅔, admedian lines complete, undulating; three lateral lines distinguishable, short; sides of shield set with tubercles in downward directed lines; dorsal tubercles 18 μ apart; dorsal setae 8 μ long, directed ahead and up; anterior shield setae 10 μ long. Forelegs 40 μ long, tibia 10 μ long bearing a seta and lateral spur, tarsus 9 μ long; claw 10 μ long, tapering and downcurved; featherclaw simple, 5-rayed. Hindleg 30 μ long, tibia 5 μ long, tarsus 8 μ long, claw 10 μ long. Coxae bearing a few tubercles. Abdomen with 65-70 rings; entirely microtuberculate, the dorsal half with lines of microtubercles. Subdorsal setae on about ring 9, 20 μ long; lateral seta on about ring 7, 20 μ long; first ventral seta 20 μ long, on about ring 20; second ventral 9 μ long, on about ring 38; third ventral 25 μ long, on about ring 5 from rear; accessory seta present. Female genitalia 20 μ wide, 18 μ long, coverflap with no scoring but basal curved lines forming a lobular design; seta 12 μ long.
Male 150 μ long, 45 μ thick.

Type locality: Rocky Camp, Hat Creek, Shasta County, California. **Collected:** August 10, 1948, by the writer. **Host:** *Cercocarpus ledifolius* Nuttall, Mountain mahogany (Rosaceae). **Relation to host:** These peculiar mites appeared during the recovery process for a leaf vagrant mite. They are presumably bud mites. **Type slide:** So designated and with the above data. Paratype slides: five in number as above. The genus is based on the striking dorsal lines shown by the mite, otherwise it is the same as *Phytoptus*. The name means "Another Phytoptus."

Trisetacus Keifer, new genus

Body elongate, wormlike. Rostrum of moderate size, downcurved. Shield broad, approximately semicircular, not projecting over rostrum base; dorsal tubercles ahead of rear shield margin, directing setae forward; a central frontal shield seta above rostrum base. Forelegs with all usual setae and a tibial spur; hindlegs with patellar seta normally placed. Abdomen with rings completely microtuberculate; a pair of anterior subdorsal setae. Female genital coverflap smooth; seminal vesicles on long stalks.

Genotype: *Phytoptus pini* Nal.

The only other California species so far on record that will go into this new genus is *cupressi* K. The status of *quadrisetus* Thom. remains to be investigated in this connection. The new genus differs from *Phytoptus* (type: *avellanae* Nal.) by the possession of three instead of four shield setae, by the normally placed hind patellar seta, and by the internal genital structures. The name is a contraction of *Acarus* plus a designation for the three setae on the shield.

ERIOPHYINAE

Pareria Keifer, new genus

Body elongate, wormlike, curved caudally. Rostrum of moderate size, downcurved. Shield broad, subtriangular, not projecting over rostrum base; dorsal tubercles near rear shield margin, but pointing forward, and projecting the dorsal setae up and forward. Legs with all usual setae. Abdomen with rings completely microtuberculate; anterior ⅔ of abdomen with dorsal and ventral sides evenly ringed; last quarter of abdomen divided into broader tergites, and sternites remaining of usual size, the tergites covering two sternites and with elongate microtubercles. Female genital coverflap longitudinally scored.

Genotype: *Pareria fremontiae* n. sp.

Pareria fremontiae Keifer, new species

Plate 211

Female 150 μ long, 30 μ thick, wormlike, caudally downcurved, color yellowish to brownish. Rostrum 21 μ long, projecting downward. Shield subtriangular, 21 μ long, 23 μ wide, central design of longitudinal lines, the median line continuous on rear half, the admedian lines set close to the median line and not diverging greatly toward rear; three submedian lines also closely spaced; shield laterally with lines of granules; dorsal tubercles 12 μ apart, near rear margin; dorsal setae 15 μ long, projecting ahead and up. Forelegs 22 μ long, tibia 5 μ long, tarsus 5 μ long, claw 9 μ long, featherclaw five-rayed. Hindlegs 20 μ long, tibia 4 μ long, tarsus 5 μ long, claw 10 μ long. Abdomen with about 60 tergites and 65-70 sternites; the broader tergites beginning about 15 rings from the rear; rings completely microtuberculate. Lateral seta 16 μ long, on about sternite 8; first ventral 23 μ long, on about sternite 21, second ventral 16 μ long, on about sternite 40; third ventral 15 μ long, on about sternite 5 from rear; accessory seta present. Female genitalia 18 μ wide, 15 μ long, coverflap with about 14 longitudinal furrows, seta 5 μ long.

Male 140 μ long, 25 μ thick.

Type locality: Phelan district, San Bernardino County, California. **Collected:** September 30, 1951, by the writer. **Host:** *Fremontia californica* Torr. Flannel bush (Sterculiaceae). **Relation to host:** The mites live in and around the heavy stellate pubescence on the green twigs and on the underside of the leaves. **Type slide:** So designated, with the above data. Paratype slides: six in number as above. This mite would fit into *Paraphytoptus* but the direction of the shield setae makes the erection of a new genus necessary. The name of the genus is *Para* plus a contraction of *Eriophyes,* since the species has the shield seta type of Eriophyes.

Aceria calaceris Keifer, new species

Plate 212

Female 180-190 μ long, 55 μ thick, yellow, wormlike. Rostrum 19 μ long, projecting diagonally down. Shield 25 μ long, 38 μ wide, subtriangular, nearly smooth, some lateral lines. Dorsal tubercles 18 μ apart, on rear margin; setae 24 μ long, projecting backward. Forelegs 30 μ long, tibia 4 μ long, with a minute seta on inner proximal side of front; tarsus 8 μ long, featherclaw 4-rayed. Hindleg 23 μ long, tibia 4 μ long, tarsus 6 μ long, claw 8 μ long. Forecoxae connate. Abdomen with more tergites than sternites: about 85 tergites and 65 sternites. Microtubercles only on the sternites, the tergites smooth. Lateral seta 16 μ long, on about sternite 8; first ventral 38 μ long, on about sternite 17; second ventral 14 μ long, on about sternite 30; third ventral 17 μ long, on sternite 5 from rear; accessory seta present. Female genitalia 17 μ wide, 12 μ long, coverflap with 8 or 9 longitudinal furrows; seta 7 μ long.

Type locality: Fallen Leaf Lake, El Dorado County, California. **Collected:** September 13, 1951, by the writer. **Host:** *Acer glabrum* Torr. Sierra Maple. **Relation to host:** These mites are found in and perhaps cause the purplish-red erineum on the leaf tips. **Type slide:** So designated with the above data. Paratype slides: six in number as above. The attractive magenta erineum which tips these maple leaves is formed of hollow capitate 'hairs' within which is the colored fluid. Slides of the mite population from this erineum disclose at least four forms. Two of these, separable on foretibial and shield structures, appear later in this article. *Aceria calaceris* is the most plentiful mite of its type in this September-collected material, but another mite form with leg structures like *calaceris* is present as a minority of the population. This latter form, males and an occasional female, does not have as much difference in the tergite-sternite relationship as does the described form, and both sexes of this latter are completely microtuberculate. We may therefore be dealing with a case of deuterogyny, which needs further investigation. The relation that these mites bear to those forming red maple leaf erineum in other parts of the Northern Hemisphere remains to be elucidated. The foretibial structure of these *Aceria* species is important; the tibia of our California species is short with a minute seta near the base on the inner-side of the front. Previous authors that have described maple erineum mites have not touched on this point.

PHYLLOCOPTINAE

Phyllocoptini

Vasates glabri Keifer, new species

Plate 213

Female 170 μ long, 55-60 μ thick, chunky, yellowish. Rostrum 24μ long, curved down. Shield 34 μ long, 45 μ wide, shield lobe over rostrum base short; shield design a network: median line discontinuous, admedians branched with submedians; dorsal tubercles on rear margin, 28 μ apart, the dorsal setae projecting 23 μ to the rear. Foreleg 33 μ long, tibia 8 μ long, with prominent seta; tarsus 7 μ long, claw 8 μ long; featherclaw 4-rayed. Hindleg 30 μ long, tibia 6 μ long, tarsus 6 μ long, claw long, tapering, slightly knobbed, 8 μ long. Abdomen with each tergite broad enough to cover about two sternites; tergites with elongate microtubercles; sternites with elliptical microtubercles; 28 tergites, 50 sternites. Lateral seta 20 μ long, on about sternite 8; first ventral 37 μ long, on about sternite 19; second ventral 17 μ long, on about sternite 31; third ventral 19 μ long, on sternite 6 from rear; accessory seta present. Female genitalia 20 μ wide, 15 μ long, coverflap with about 8 longitudinal furrows; seta 15 μ long.

Male not seen.

Type locality: Fallen Leaf Lake, El Dorado County, California. **Collected:** September 13, 1951, by the writer. **Host:** *Acer glabrum* Torr. (Aceraceae), Sierra maple. **Relation to host:** The mites are part of the population complex in the magenta-colored leaf erineum. **Type slide:** So designated with the above data. Paratype slides: five in number as

above. This mite is presumably an inquilin if we are to attribute the formation of the erineum to the *Aceria* species described above. These maple leaves have so far not disclosed the presence of a leaf vagrant living on the open leaf surface.

Vasates paraglabri Keifer, new species

Plate 214

Female 165 μ long, 50 μ thick, somewhat wormlike, yellowish. Rostrum 20 μ long, curved downward. Shield 35 μ long, 38 μ wide; anterior lobe over rostrum short; design a network; the median line present only to rear, admedian and submedian lines branched and running together; dorsal tubercles on rear margin, 22 μ apart, the setae projecting backwards 26 μ. Foreleg 32 μ long, tibia 7 μ long with a prominent seta; tarsus 7 μ long, claw 8 μ long, tapering, slightly knobbed; featherclaw 4-rayed. Hindleg 27 μ long, tibia 5 μ long, tarsus 6 μ long, claw 7 μ long. Abdomen with about 60-65 rings, even dorsoventrally, with a few more tergites; microtubercles present on all parts of abdomen. Lateral seta 23 μ long, on about sternite 8; first ventral 36 μ long, on about sternite 19; second ventral 16 μ long, on about sternite 32; third ventral 20 μ long, on about sternite 5 from rear; accessory seta present. Female genitalia 20 μ wide, 14 μ long, coverflap with 8-9 longitudinal furrows; seta 11 μ long.

Male not seen.

Type locality: Fallen Leaf Lake, El Dorado County, California. **Collected:** September 13, 1951, by the writer. **Host:** *Acer glabrum* Torr, Sierra maple. **Relation to host:** The mites are inquilines in the magenta leaf erineum. **Type slide:** So designated with the above data. Paratype slides: five in number, as above. *Vasates glabri* and *paraglabri* are two of the four types of mites in the population complex in the magenta-colored maple leaf erineum. The tibial structure of these *Vasates* species is one of the easiest ways to separate them under the microscope from the *Aceria* species. The two *Vasates* species are separable first on the tergite-sternite relationship and also on the shield patterns. These characters are amply shown in the illustrations. These characters seem to preclude the idea that these may be but phases of one *Vasates* species. Hodgkiss (N. Y. Agr. Exp. Sta. Tech. Bul. 163, July 1930) has figured *Vasates* spp. inquilin in red maple erineum in the Eastern United States, but these figures indicate the species are different from the ones described above.

Epitrimerus abietis Keifer, new species

Plate 215

Female 190 μ long, 70 μ wide, 45 μ thick, yellowish, spindleform shape. Rostrum 40 μ long, projecting diagonally down. Shield broad triangular with prominent acute lateral lobes; anterior lobe over rostrum broad; central lines distinct, the median present, admedians curved, submedian lines joining toward rear with dorsal tubercles: dorsal tubercles 25 μ apart, ahead of rear margin; setae 5 μ long, projecting up. Legs with femoral setae present; foreleg 40 μ long, tibia 10 μ long, tarsus 8 μ long, claw 8 μ long with apical knob. Hindleg 37 μ long, tibia 8 μ long, tarsus 7 μ long, claw 7 μ long, featherclaw 5-rayed. Coxae just touching centrally. Abdomen with 33 tergites, and about 80-85 sternites; the tergites without microtubercles and with a subdorsal shallow furrow on each side; sternites with fine microtubercles. Lateral seta 23 μ long, on about sternite 12; first ventral 35 μ long, on about sternite 33; second ventral 25 μ long, on about sternite 54; third ventral 23 μ long, on about sternite 7 from rear; accessory seta absent. Female genitalia 30 μ wide, 20 μ long, coverflap with about 20 longitudinal furrows, somewhat irregular, basal fine striations; seta 16 μ long.

Male not studied.

Type locality: Fallen Leaf Lake, El Dorado County, California. **Collected:** September 12, 1947, and September 13, 1951, by the writer. **Host:** *Abies concolor* L. & G., (Pinaceae), White fir. **Relation to host:** The mites are needle vagrants, appearing late in the season on fresh growth. **Type slide:** As above, dated September 12, 1947. Paratype slides: ten in number, with six bearing the date September 12, 1947, and four dated September 13, 1951. This is the first *Epitrimerus* recorded on fir. It is distinguished in part by the sharp lateral shield lobes.

Epitrimerus cupressifoliae Keifer, new species

Plate 216

Female 180 μ long, 55 μ wide, 45 μ thick, spindleform, brownish. Rostrum 31 μ long, curved down. Shield 50 μ long, 45 μ wide, lobe over rostrum somewhat acute; shield design of obscure lines; dorsal tubercles 20 μ apart, ahead of rear margin; dorsal setae 10 μ long, projecting up and inward. Legs with femoral setae; foreleg 34 μ long, tibia 9 μ long, with seta placed nearer apex; tarsus 7 μ long, claw 7 μ long, featherclaw 6-rayed. Hindleg 30 μ long, tibia 7 μ long, tarsus 7 μ long, claw 7 μ long. Forecoxae barely touching at base, slightly granular. Abdomen with 33 tergites that in some specimens have obscure elongate microtubercles; tergites forming a broad central ridge and a series of lateral lobes with a furrow between. Sternites 47 in number, microtuberculate. Lateral seta 27 μ long, on sternite 10; first ventral 23 μ long, on sternite 27; second ventral 15 μ long, on about sternite 45; third ventral 15 μ long, on about sternite 5 from rear; accessory seta absent. Female genitalia 30 μ wide, 22 μ long, coverflap with about 6 diagonal furrows, three converging from each side; seta 17 μ long.

Male not studied.

Type locality: Occidental district (county dumps), Sonoma County, California. **Collected:** September 2 and 6, 1951, by J. P. Keifer and the writer. **Host:** *Cupressus sargentii* Jepson (Cupressaceae), Sargent cypress. **Relation to host:** These mites lurk in the crevices of the scale-like leaves on the vigorous growing tips. **Type slide:** As above, bearing the date September 6th. Five paratype slides, four of which are dated September 2d and the other September 6th. A mite that is apparently identical to this one was collected by the writer on *Juniperus californicus* Carr. on Mt. Diablo, September 20, 1951, and on the same host in the Phelan district of San Bernardino County, October 5, 1951. The generic placement of this mite is admittedly uncertain. Conifer mites tend to have peculiarities, which while not definite enough to define readily, nevertheless make them taxonomic problems.

Calacarus tejonis Keifer, new species

Plate 217

Female 160-165 μ long, 50 μ wide, 50 μ thick, robust, purple; in life with five longitudinal stripes of white wax on dorsal half of abdomen, and wax on the elleptical shield carina. Rostrum 45 μ long, projecting down. Shield 53 μ long, 51 μ wide, with a rather short, broad lobe over rostrum; design a longitudinal elliptical carina around the center, open anteriorly; dorsal tubercles indicated, 30 μ apart and ahead of the rear margin; dorsal setae missing. Legs with femoral setae present; foreleg 40 μ long, tibia 9 μ long, tarsus 9μ long, claw 7.5 μ long, slender, slightly knobbed; featherclaw 7-rayed. Hindleg 33 μ long, patellar seta absent, tibia 6 μ long, tarsus 7 μ long, claw 9 μ long. Forecoxae broadly spread and hardly touching. Abdomen with five longitudinal wax-bearing ridges on dorsal half, with slight furrows in between; 55-60 tergites; 60-70 sternites; sternites with fine microtubercles. Lateral seta 35 μ long, on about sternite 10; first ventral 35 μ long, on about sternite 25; second ventral 28 μ long, on about sternite 44; third ventral 22 μ long, on about sternite 6 from rear; accessory seta missing. Female genitalia 34 μ wide, 20 μ long, coverflap smooth; seta 25 μ long.

Male not seen.

Type locality: Fort Tejon, Kern County, California. **Collected:** November 20, 1951, by the writer. **Host:** *Quercus lobata* Nee, (Fagaceae), Valley Oak. **Relation to host:** The mites are upper surface vagrants on the leaves. **Type slide:** So designated and bearing the above data. Four paratype slides as above. The other species in California referable to this genus are *adornatus* (K.) on Camellia, and *pulviferus* K. on Kellogg oak. Both of these species have a considerably more elaborate shield pattern than the new species.

Anthocoptes pickeringiae Keifer, new species

Plate 218

Female 160-170 μ long, 40-45 μ thick, orange color, spindleform. Rostrum 30 μ long, projecting down. Shield 30 μ long, 44 μ wide, with a moderately broad lobe over rostrum base; design a network with the median line obsolete, the submedian lines forming most of the pattern; dorsal tubercles 25 μ apart, on rear margin; dorsal setae projecting backward 30 μ. Legs with femoral setae; foreleg 30 μ long, tibia 7 μ long, tarsus 7 μ long, claw 7 μ long, slightly knobbed; featherclaw 7-rayed. Hindleg 30 μ long, tibia 6 μ long, tarsus 7 μ long, claw 7 μ long. Anterior coxae connate, the coxae somewhat granular. Abdomen with 14 tergites, all but the posterior three of which are very broad; tergites with slight microtuberculation on the rear margins; sternites completely microtuberulate, 55 in number. Lateral seta 18 μ long, on about sternite 7; first ventral 32 μ long, on about sternite 18; second ventral 10 μ long, on about sternite 34; third ventral 12 μ long, on about sternite 5 from rear; accessory seta absent. Female genitalia 23 μ wide, 12 μ long, coverflap with about 14 longitudinal furrows; seta 25 μ long.
Male 150 μ long, 40 μ thick.

Type locality: Occidental, Sonoma County, California. **Collected**: September 6, 1951, by the writer. **Host**: *Pickeringia montana* Nutt. (Leguminosae), Pea chaparral. **Relation to host**: The mites are vagrants on the leaves and green stems. **Type slide**: So designated with the above data. Six paratype slides also bear this data. The seven-rayed featherclaw is one of the distinguishing features for this mite; no other California species has more than five rays.

PHYLLOCOPTINAE

Diptilomiopini

Asetacus Keifer, new genus

Body robust-spindleform. Rostrum large, set at right angles to the body and tapering; chelicerae projecting forward a short distance, then abruptly bent downward, with a further slight curve above middle of verticle portion. Shield broad; lobe over rostrum base short and broad, emarginate; dorsal tubercles indicated ahead of rear shield margin, but dorsal setae missing. Anterior coxae with a sharp ridge between. Legs long and slender; femoral setae missing, but other usual setae present; tibiae long and slender, with foretibial seta; featherclaw simple. Abdomen with narrow rings, the tergites almost as numerous as the sternites. Female genitalia with coverflap bearing a double rank of short furrows.

Genotype: *Asetacus madronae*, new species.

Asetacus madronae Keifer, new species

Plate 219

Female 200 μ long, 70 μ thick, very light yellow in color with a white pulverulence when living. Rostrum 65 μ long, tapering. Shield 50 μ long, 60 μ wide, the anterior lobe broadly knotched centrally; design of irregular longitudinal lines but indicating median and admedian lines; submedian lines shorter and separated laterally; dorsal tubercles indicated but bearing no setae. Foreleg 58 μ long, patellar seta present, tibia 15 μ long, tarsus 12 μ long, claw 10 μ long, featherclaw 6-rayed. Hindleg 49 μ long, patellar seta present, tibia 11 μ long, tarsus 11 μ long, claw 11 μ long. Abdomen with 80-85 tergites which are narrow but lack microtubercles; sternites 95, microtuberculate. Lateral seta 38 μ long, on about sternite 14; first ventral 48 μ long, on about sternite 30; second ventral 30 μ long, on about sternite 66; third ventral 45 μ long, on sternite 9 from rear; accessory seta absent. Female genitalia 38 μ wide, 28 μ long, coverflap with about 14 longitudinal furrows in two ranks; seta 20 μ long.
Male not studied.

Type locality: Duncans Mills district (Russian River), Sonoma County, California. **Collected**: September 4, 1951, by the writer. **Host**: *Arbutus menziesii* Pursh. (Ericaceae), Madrone. **Relation to host**: The mites are undersurface leaf vagrants. **Type slide**: So designated with the above data. Eight paratypes also bear this data. The new genus and

species occupy a position in this tribe part way between the genera with simple featherclaws and no sharp ridge between the forecoxae, and those which have divided featherclaws. This is the first genus with simple featherclaws to lack the dorsal setae. The name of the genus is a contraction of "aseta," without setae, and *Acarus*.

DESIGNATIONS ON PLATES

AP1—Internal female genitalia
D—Dorsal view of mite
DA—Dorsal view of anterior section of mite
ES—Detail of side skin
F—Featherclaw
GF1—Female genitalia and coxae from below
L—Left legs
S—Side view of mite
SA—Side view of anterior section of mite

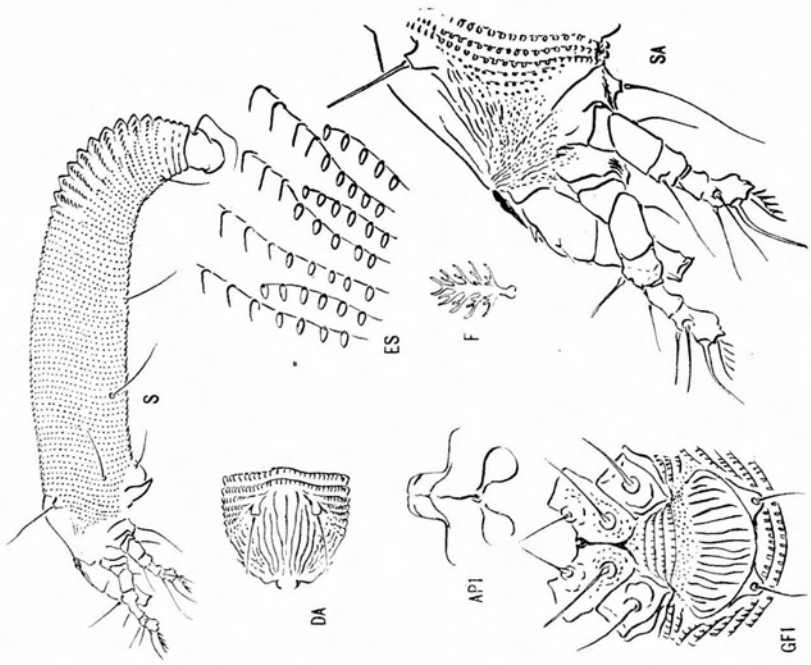

Plate 211—*Pareria fremontiae*, n. sp.

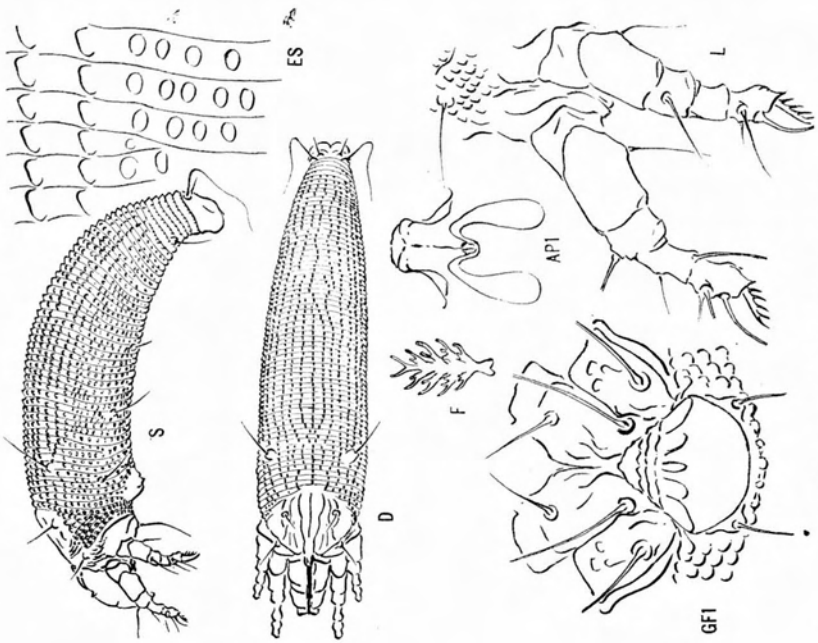

Plate 210—*Anchiphytoptus lineatus*, n. sp.

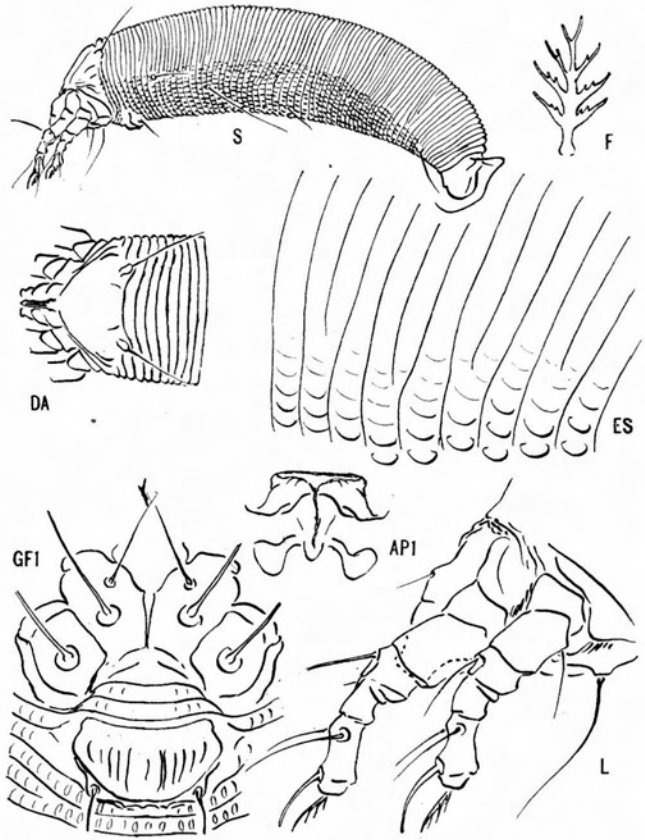

Plate 212—*Aceria calaceris*, n. sp.

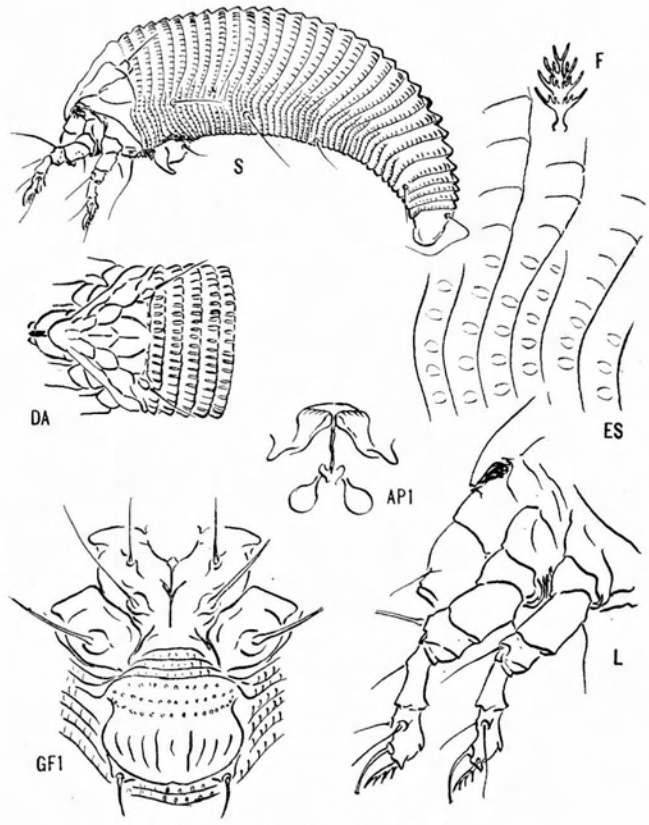

Plate 213—*Vasates glabri*, n. sp.

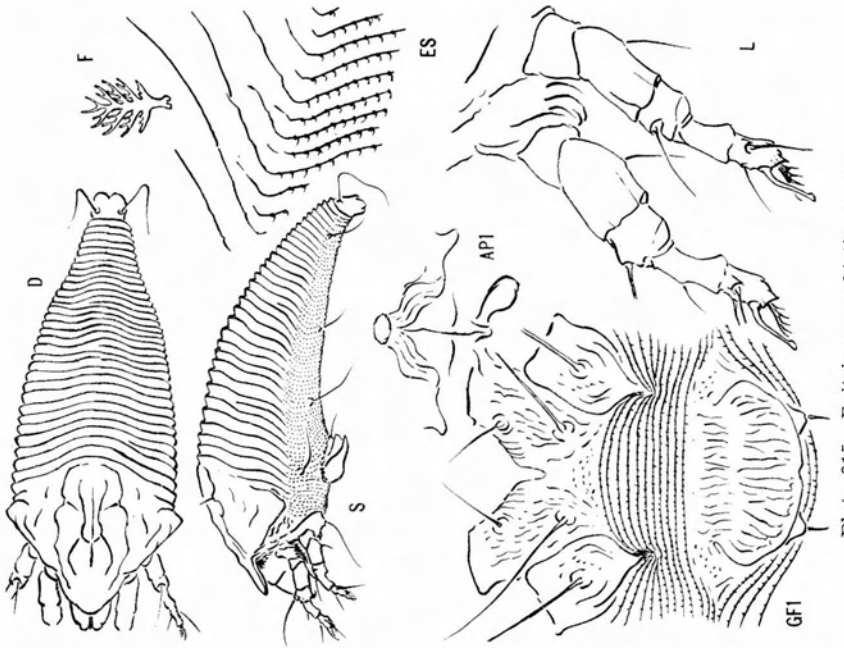

Plate 215—*Epitrimerus obictis*, n. sp.

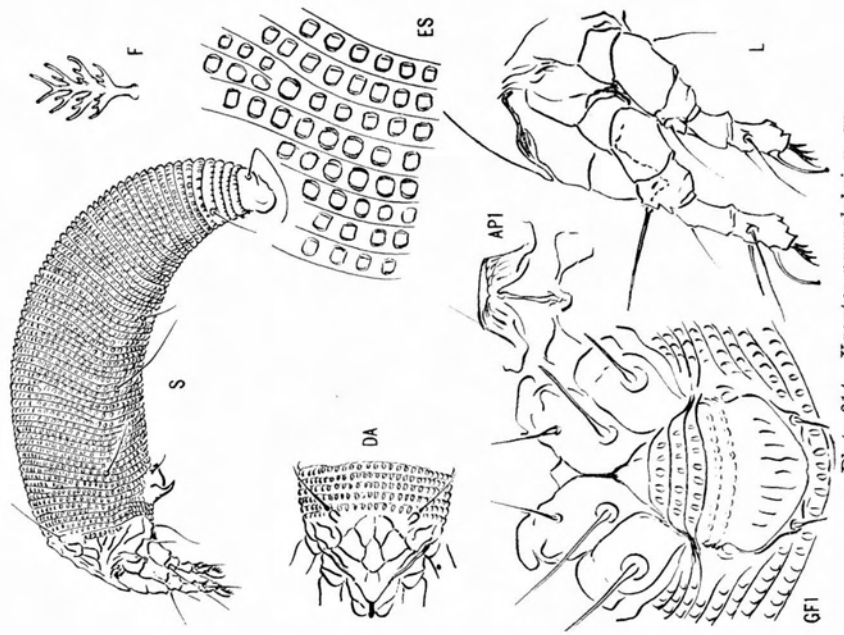

Plate 214—*Vasates paraglabri*, n. sp.

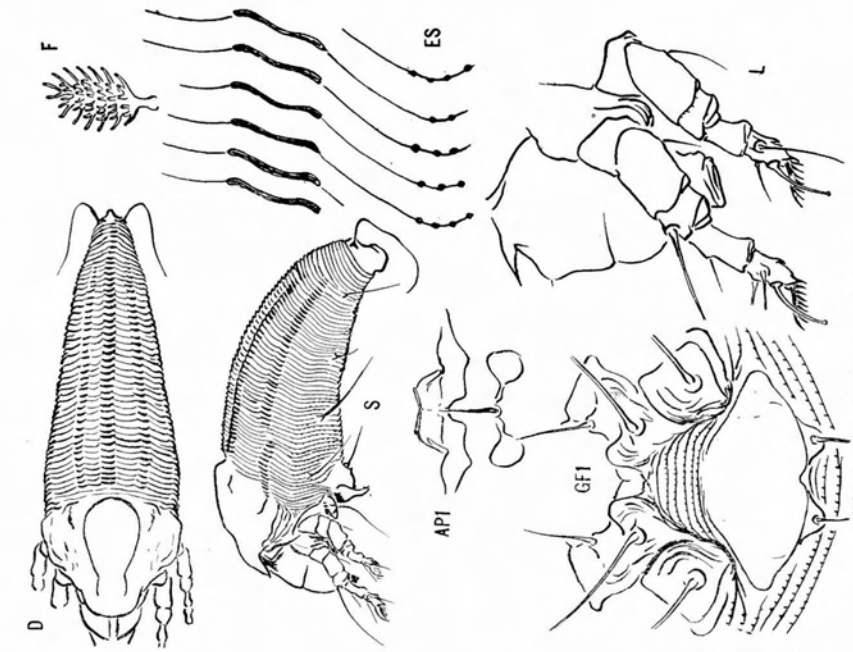

Plate 217—*Calacarus tejonis*, n. sp.

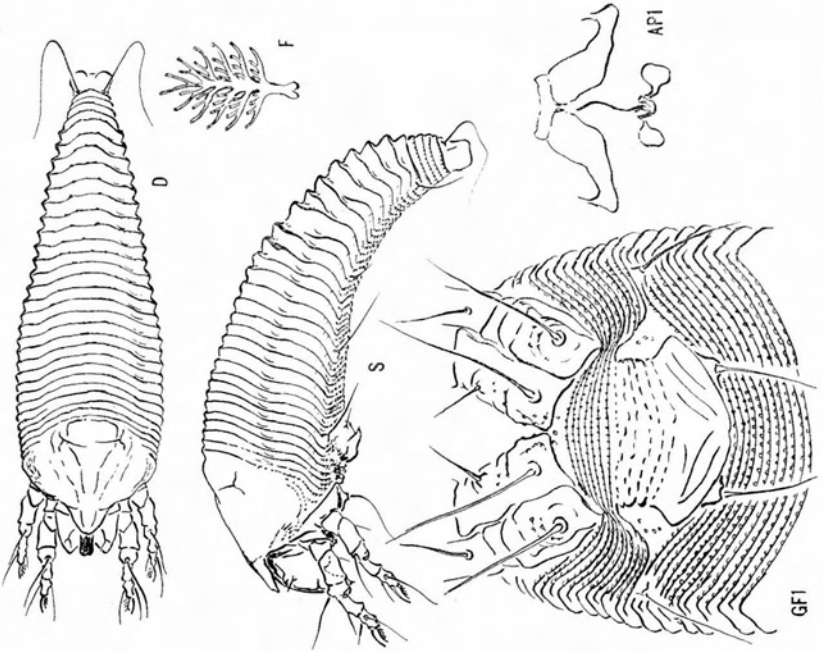

Plate 216—*Epitrimerus cupressifoliae*, n. sp.

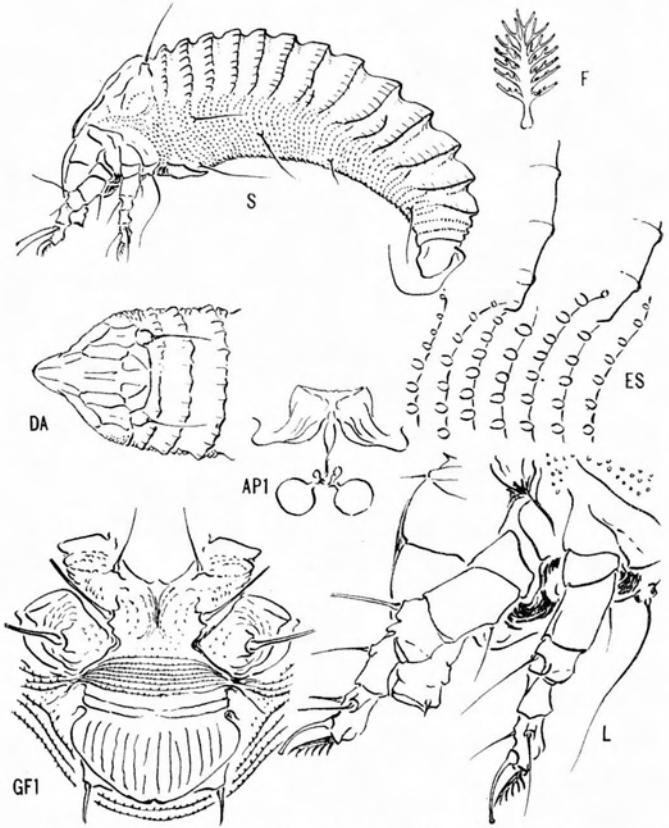

Plate 218—*Anthocoptes pickeringiae*, n. sp.

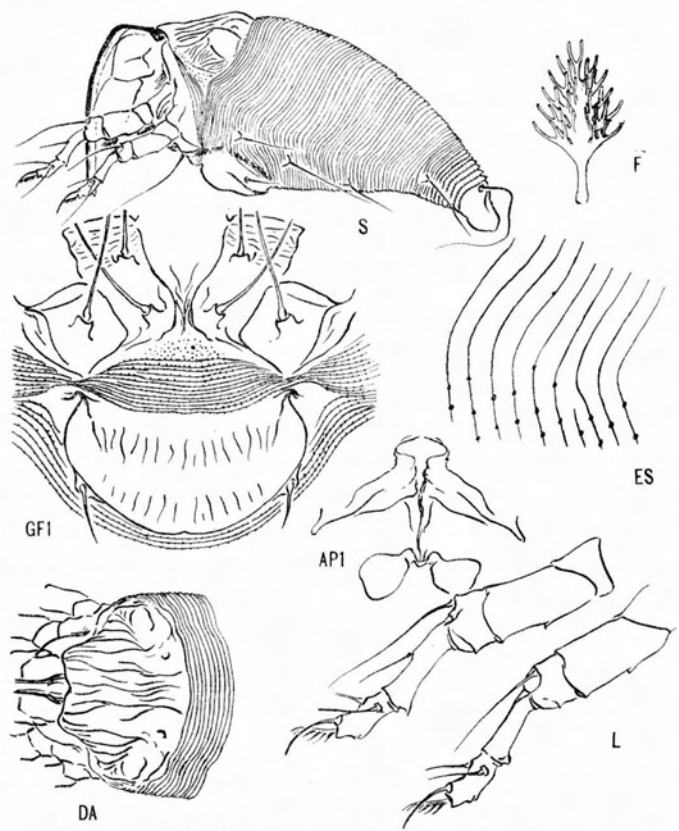

Plate 219—*Asetacus madronae*, n. sp.

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